



Operating Instructions



Elmasonic X-tra

Ultrasonic Cleaning Unit



TECHSPAN

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1

General

The present Operating Instructions are part of the delivered equipment. They must be ready for use at any time and remain with the unit in case of resale.

We reserve the right to carry out technical modifications on the unit due to advanced development.

An operating manual cannot take account of every conceivable use. An operating manual cannot take account of every possible use. Contact your dealer or the manufacturer for further information or in the event of problems which are not covered or not sufficiently covered in this operating manual

2

Important safety warnings

Please observe any additional national safety regulations that may apply.

2.1

Instructions for the use of the present manual

Carefully read the Operating Instructions before you operate the unit. Do not use the present electrical unit for any purpose other than described in the Operating Instructions.

Warning symbols used in the present manual:



This symbol warns of the risk of injury caused by electricity.



This symbol warns of the risk of injury caused by explosion and/or deflagration.



This symbol warns of the risk of injury caused by hot surfaces and liquids.



This symbol warns of the risk of injury.



This symbol warns of the risk of damage to the equipment.



This symbol marks additional information.

Signal words used in the present manual:

Danger

The signal word danger warns of a potential risk of serious injury and danger to life.

Warning

The signal word warning warns of the risk of serious injury and heavy damage to the equipment.

Caution

The signal word caution warns of the risk of light injury or damage to the equipment.

Attention

The signal word attention warns of the risk of damage to the equipment.

2.2 Instructions for the use of the unit

Intended use	<p>The present Elma ultrasonic cleaning unit has been designed for the treatment of items and liquids only.</p> <p>Do not treat living beings or plants in an ultrasonic unit</p>
User	<p>Operation of the unit by authorized and instructed staff only. Observe the instructions given in the manual.</p>
Check for damages	<p>Check unit and mains cable for transport damages. In case of visible damages do not put the unit into operation.</p>
Mains connection	<p>For safety reasons, the present unit must be connected to a correctly grounded socket only. The technical details indicated on the nameplate must correspond with the available mains connection details, in particular those of the mains voltage and current connected value.</p>
Placement	<p>Place the unit at a dry and sufficiently ventilated workplace. Keep the workplace, housing and operating elements dry. Protect the unit from entering humidity!</p>
Prevention of electrical accidents	<p>For purposes of maintenance and care of the unit, in case of suspected humidity inside the unit or in case of malfunctions and after operation pull the mains plug. The unit must be opened by authorized specialized personnel only.</p>
Cleaning liquid	<p>Fill the unit with a sufficient quantity of cleaning liquid before switch-on. Flammable liquids must not be treated by ultrasound directly in the cleaning tank: risk of fire and explosion!</p>

3 Product description

3.1 CE conformity

The present Elma ultrasonic cleaning unit is in compliance with the CE marking criteria.

The declaration of conformity is available from the manufacturer.

3.2 Elma X-tra product features

Elma X-tra – High technology "made in Germany":

- transducer tank made of cavitation-proof special steel with 3-year warranty
- powerful performance due to additional transducer systems
- optimized sound distribution through continued sweeping (electronic oscillation of the sound field)
- 2 cleaning stages: Powerclean for the intensive cleaning and Softclean for the gentle cleaning of sensitive items
- high heating power for quicker heating-up processes
- dry-run protected heating
- quick draining through welded piping
- operating panel protected against splashing water
- easy handling due to removable unit connection cable

3.3 Functioning

Today, cleaning by ultrasound is the most modern fine cleaning method.

The electric high-frequency energy created by an ultrasonic generator is transformed into mechanical energy by piezoelectrical transducer systems and is then transmitted into the bath.

This process creates millions of tiny vacuum bubbles, which implode due to the variations of pressure caused by the ultrasonic activity. Highly energetic liquid jets are created. These jets remove dirt particles from surfaces and even from the smallest grooves and bores.

In order to achieve efficient cleaning results the liquid in the cleaning bath must contain a suitable cleaning chemical.

3.4 Technical details

	X-tra 30 H	X-tra 50 H	X-tra 70 H	X-tra 150 H
Max. filling volume tank (lit.) / (gal)	3.0 / 0.8	4.5 / 1.2	6.5 / 1.7	14.0 / 3.7
Operating volume tank (lit.) / (gal)	2.0 / 0.5	3.5 / 0.9	5.0 / 1.3	10.0 / 2.6
Tank dimensions W x D x H (mm) (inch)	240x130x100 9.5x5.1x3.9	240x130x150 9.4x5.1x5.9	300x150x150 11.8x5.9x5.9	300x240x200 11.8x9.4x7.9
Outer dimensions W x D x H (mm) (inch)	360x230x250 14.2x9.0x9.8	360x230x300 14.2x9.0x11.8	420x250x300 16.5x9.8x11.8	420x340x350 16.5x13.4x13.8
Material tank / housing	stainless steel	stainless steel	stainless steel	stainless steel
Drain	3/8"	3/8"	3/8"	1/2"
Weight (kg) / (lbs)	7.1 / 15.6	8.3 / 18.3	9.6 / 21.2	13.2 / 29.1
Basket inner dimensions W x D x H (mm) / (inch)	224x106x48 8.8x4.3x1.8	224x106x76 8.8x4.3x3.0	284x126x76 11.2x5.1x3.0	283x216x136 10.6x8.3x5.3
Mesh size of the basket (mm) / (inch)	6 / 0.24	6 / 0.24	6 / 0.24	9 / 0.35
Mains voltage (Vac)	115 / 230	115 / 230	115 / 230	115 / 230
Mains frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60
Mains connection	1 ph. prot. earth	1 ph. prot. earth	1 ph. prot. earth	1 ph. prot. earth
Power consumption (W)	540	580	600	1120
Ultrasonic frequency (kHz)	35	35	35	35
US power RMS (W)	70 / 120 switchable	100 / 160 switchable	110 / 180 switchable	180 / 300 switchable
HF permanent peak performance max. (W) *	480	640	720	1200
Heating power (W) variable between 20-80°C / 68°-176°F	400	400	400	800
Sweep function continuously	✓	✓	✓	✓
Timer 15 min/permanent operation	✓	✓	✓	✓

* Due to the form of the signal the value of the ultrasonic peak maximum is four times higher

3.5

Description and functioning of operating elements



Illustration 3.1 Elements front view

- A** Timer for ultrasonic operation. Two operating modes: 1-15 min for short period operation (with automatic switch-off) permanent operation ∞ (manual switch-off)
- B** Ultrasound selector switch for two cleaning stages.
power: for intensive cleaning and
soft: for gentle cleaning of sensitive items
- C** Heating switch
- D** Control of heating thermostate 20 – 80°C
- E** Ultrasound control lamp indicating ultrasonic operation
- F** Heating control lamp indicating heating operation

4 Initial operation

Check for transport damages

Check the Elma X-tra for possible transport damages before initial operation.

In case of visible damages **do not** connect the unit to the mains. Contact your supplier and forwarding agent.

Placement

For operation, place the unit on a dry and solid surface. Ensure that the workplace is sufficiently ventilated!



DANGER

Risk of electrocution due to humidity inside the unit!
Protect the unit from entering humidity.

The unit inside is splashwater-proof. Keep workplace and housing dry in order to prevent electrical accidents and damages on the unit.

Ambient conditions

- Allowed ambient temperature during operation: +5°C - +40°C
- Allowed relative humidity of air during operation: max. 80%
- No condensation

Connect the unit to the mains

Connect the unit to a correctly grounded shockproof socket only.
The mains plug must be connected to an easily accessible socket only, as it serves as interrupted device!

4.1

Filling of the unit

Observe filling level

Fill the cleaning tank with a sufficient quantity of a suitable cleaning liquid before operation. See illustration 4.1

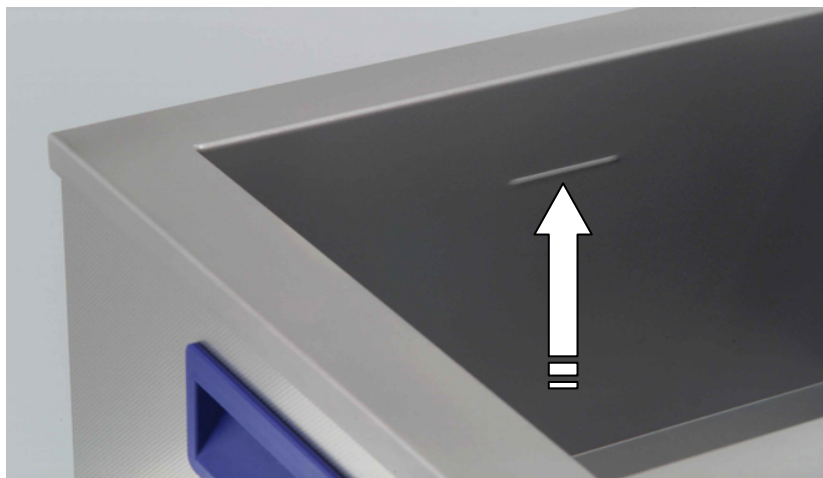


Illustration 4.1 optimum filling level at marking on tank wall



Dry running of the transducer tank can cause damage to the unit.

Ensure that the cleaning tank is filled to the optimum level during operation (see tank marking).

Suitable cleaning agents

Ensure that the chosen cleaning chemical is suitable for treatment in an ultrasonic bath and observe the instructions on dosage and the compatibility of the material.

We recommend the use of the cleaning agents listed in section 6.1.

Prohibited cleaning agents

Flammable products are not allowed for use in an ultrasonic bath. Observe the instructions given in section 6 (cleaning media).

Restrictions concerning further cleaning media are also indicated in the instructions given in section 6.
For queries please contact the manufacturer or your supplier.

Degassing of liquids

Freshly mixed cleaning liquids are saturated with air which lessens the cleaning effect of the ultrasonic activity. By sounding the liquid over a period of several minutes before the cleaning process the tiny air bubbles in the liquid are eliminated.



ATTENTION

Danger of damage to the transducer system!
Fill no liquid > 60°C and < 10°C in the ultrasonic tank.

5 Cleaning

5.1 Heating up of the cleaning liquid

Depending on the degree and kind of contamination and on the cleaning medium used it is recommendable to heat up the cleaning liquid.

**Turn switch
„heating“ to position
„on“**

Switch on the heating. The yellow control lamp "heating" is turned on.

**Setting of temperature
at thermostat**

Select the required cleaning temperature. The tank must be filled at least half. The optimum filling level is marked on the tank wall (page 7 - illustration 4.1).

In order to achieve a uniform heating of the cleaning liquid it is necessary to switch on the ultrasound from time to time or to stir the liquid.



Without stirring of the liquid the heat will rise to the surface. There will be a considerable gradient of temperature within the cleaning tank (the temperature difference between the liquid surface and the bottom of the tank can be as high as 40°C). Also, lime settings will form around the heating element because the high temperature is not fully transmitted to the liquid.

5.2 Placement of cleaning items

Caution! Do not place the cleaning items directly on the bottom of the transducer tank as this might lead to damages on the unit.

Cleaning basket Put the cleaning items into the stainless-steel cleaning basket.

5.3

Start-up of the cleaning process



Do not reach inside the tank during ultrasonic operation!

Cell walls can be damaged by prolonged exposure to ultrasonic activity.

For taking out the cleaning items always switch off the unit.

Switch on timer	Set the timer to the required cleaning period: timer operating mode or permanent operating mode.
Timer operating mode	For short operating periods set the timer to timer operating mode (1-15 min). The unit starts the ultrasonic cleaning process and automatically switches off after the set period. This process can be repeated as often as necessary.
Permanent operating mode	For longer cleaning cycles switch the timer to the left into permanent operating mode (∞). In this operating mode the unit does not automatically switch off. The ultrasound must be switched off manually after the cleaning process is finished (position "off").
Setting of power	Select the required power according to the intended cleaning intensity:
soft	Gentle cleaning for the removal of light contamination and for the cleaning of sensitive surfaces.
power	Intensive cleaning for tenacious contamination and for the quick cleaning of robust surfaces.
Aftertreatment: rinsing/drying	After the cleaning process thoroughly rinse the cleaned items in running water and dry in a drying unit or wipe with a cloth.

6

Cleaning media



The cleaning chemical to be used must be suitable for the use in an ultrasonic bath to prevent damage to the tank or injuries to the user. Use the recommended cleaners mentioned in *section 6.3*. Observe the restrictions to cleaners containing solvents and aqueous cleaners mentioned *in sections 6.1 and 6.2*.

For queries please contact the manufacturer or your supplier.

Exclusion of liability

Damages caused by non-compliance with the instructions given in *sections 6.1 and 6.2* will not be covered by the manufacturer's warranty!

6.1

Limitations of use of cleaners containing solvents



Risk of fire and explosion!

Never use flammable liquids or solvents directly in the ultrasonic cleaning tank.

We recommend to use the cleaning media listed in section 6.



Ultrasound increases the vapourisation of liquids and creates finest vapours which can easily catch fire at ignition sources.

- marked in compliance with the EEC directives by symbols and safety warnings R 1 to R 9
- or E, F+, F, O or R 10, R 11 or R 12 for flammable substances

into the stainless steel tank for ultrasonic treatment.

Exception

In compliance with the general regulations on the protection of labour, certain limited volumes of flammable liquids (max. 1 litre) can be used in an ultrasonic cleaning unit under the following conditions: these liquids must be filled into a suitable separate vessel (e.g. beaker) with sufficient ventilation; this vessel (beaker) can then be put into the stainless steel tank which is filled with non-flammable liquid (water with a few drops of surfactant).

6.2

Limitations on aqueous cleaners



Risk of damage to the transducer tank!

Do not use acid cleaners (pH value below 7) directly in the stainless-steel tank if the items to be cleaned carry contaminations with halogenides (fluorides, chlorides or bromides).

The same applies to salt solutions (NaCl).

We recommend to use the cleaning media listed in section 6.



The stainless-steel tank can be destroyed by crevice corrosion within a very short period. Such substances can be contained in household cleaners.

Acids and alkaline solutions

Other media which can destroy the stainless-steel tanks when used in high concentrations or with high temperatures during ultrasonic operation are: nitric acid, sulphuric acid, formic acid, hydrofluoric acid (even diluted). (Completeness of list not guaranteed.)

Risk of damage to the unit: do not use cleaning solutions containing more than 0.5 mass % alkali (KOH and/or NaOH) in an ultrasonic cleaning tank.

Entrainment of chemical substances

The above limitations for the use of chemicals in an ultrasonic bath also apply for the aforementioned chemicals when these are brought into an aqueous (particularly distilled water) bath through entrainment or from the removed dirt.

Acid-resistant tank

For the ultrasonic treatment with the above mentioned media use an acid-resistant tank (available as accessory equipment).

Disinfectants

The limitations of use also apply to the standard cleaners and disinfectants if these contain the above mentioned compounds.

Safety regulations

Observe the safety warnings indicated by the manufacturer of the chemicals (e.g. goggles, gloves, R and S phrases).

For queries please contact the manufacturer or your supplier.

6.3 List of recommended cleaning media

Elma has a large range of suitable cleaning products developed by chemical engineers in the Elma laboratory. Please contact your supplier to find the most suitable cleaning chemical for your application.

Environment – friendly products

The organic detergents contained in the elma clean cleaning concentrates are biodegradable. Product informations and safety data sheets are available from the manufacturer.

6.3.1 Dental

- elma clean 10** Universal cleaner for the cleaning of instruments and laboratory equipment made of plastic, ceramic, stainless steel, rubber and glass.
- elma clean 25** Cleaner for impression spoons: removes dental plaster and alginates. Ready-for-use cleaning bath.
- elma clean 35** Cleaner for prostheses with activated oxygen for the cleaning of dental prostheses made of metal and plastic. The released oxygen refreshes the prosthesis hygienically.
- elma clean 40** Chemical for the removal of cement and carbonate (lime). For the cleaning of precious metals, ceramics, plastics, glass and rubber. Removes metal oxide, cement, fluxing media, etc.
- elma clean 55d** Aldehyde-free drill cleaner for instruments made of stainless steel. For the hygienical removal of amalgam remains, blood, tissue, etc.; with anti-corrosion effect.
- elma clean 60** Acid cleaner for instruments made of stainless steel, glass and plastic. Removes corrosion, rust films and mineral deposits.

6.3.2 Medical

- elma clean 10** Universal cleaner for the cleaning of instruments and laboratory equipment made of plastic, ceramic, stainless steel, rubber and glass.
- elma clean 60** Acid cleaner for instruments made of stainless steel, glass and plastic. Removes corrosion, rust films and mineral deposits.

6.3.3 Optics

- elma opto clean** Cleaning concentrate for glasses, frames, optical lenses and components. Also suitable for plastics.

6.3.4 Laboratory

elma lab clean S10	Acid cleaning concentrate for glass, ceramics, metal incl. light and non-ferrous heavy metals, plastic. Removes mineral deposits, lime, lime soap and non-ferrous heavy metal oxides, mineral grease and oil.
elma lab clean S20	Strong acid cleaning concentrate for stainless steel, glass and plastic. Removes tenacious contaminations such as rust, organic residues, inorganic compounds and mineral grease and oil. Not suitable for aluminum and light metal alloys.
elma lab clean N10	Neutral universal and laboratory cleaning concentrate for sensitive materials such as aluminum and light metals. Removes lime soap, light oil and grease and finger marks.
elma lab clean A10	Alkaline cleaning concentrate for glass, porcelain, metal and plastic. Removes grease, glass grease, gumming, remains of labels and calcification. Also suitable for the laboratory rinsing machine.
elma lab clean A20sf	Special cleaning concentrate for pipettes, does not contain any tensides. Mildly alkaline, suitable for use in an ultrasonic cleaning unit and in the laboratory rinsing machine. Also suitable for use in pipette rinsing machines that require active cleaning agents (soaking).

6.3.5 Jewellery

elma clean 75	Ammoniacal cleaner with brightening effect for precious and nonferrous heavy metals; for the removal of abrasive and polishing pastes. Not suitable for soft stones, pearls or corals.
elma clean 85	Gentle cleaner for the jewellery workshop. Suitable for soft stones and fancy jewellery.
elma noble clean	Cleaning and brightening of gold, silver and platinum jewellery within seconds. Not suitable for soft stones, pearls or corals.
elma ultra clean	Extra gentle cleaner for precious metal jewellery with stones. Clean soft stones without ultrasound.
elma super clean	Cleaner for jewellery made of precious metals, with brightening effect. Clean soft stones without ultrasound.

6.3.6 Watches

- | | |
|--|---|
| elma chrono clean
1:20 | For the aqueous cleaning of disassembled watches / clocks; removes resin residues and rust. |
| elma reinigungs-
konzentrat 1:9 | Aqueous cleaner for disassembled watches / clocks with brightening effect. |

6.3.7 Industry and workshop

- | | |
|--------------------------|--|
| elma tec clean A1 | Cleaning concentrate (alkaline) for electronics and fine optics: removes light oils, grease, fluxing agents, dust, finger prints, etc. |
| elma tec clean A2 | Intensive cleaner (ammoniacal) with brightening effect for nonferrous and precious metals: removes grinding, polishing and lapping media, grease, oil, etc. |
| elma tec clean A3 | Cleaning concentrate (alkaline) for iron, steel, stainless steel and precious metals: removes punching oil, drawing grease, soot, forge, grinding and polishing media, high-performance cooling lubricants, etc. |
| elma tec clean A4 | Universal cleaning concentrate (alkaline): removes oil, grease, soot, coking, forge, dust, finger prints, etc. |
| elma tec clean A5 | Powerful cleaner (alkaline) in powder form for iron and light metals: removes forged and gummed oil and grease, grinding and polishing media, lacquer and paint remnants, wax, etc. |
| elma tec clean N1 | Neutral cleaning concentrate: removes oil, grease, grinding, lapping and polishing media, dust, sweat, finger prints, etc. |
| elma tec clean S1 | Mild acid cleaning concentrate: removes rust, lime, oxide films (e.g. verdigirs), grease, oil, etc. |
| elma tec clean S2 | Strong acid cleaning concentrate: removes mineral contaminations such as lime, rust and other oxides, films that can be removed with corrosives, etc. |

7 Maintenance

7.1 Maintenance / Care



CAUTION

Pull the mains plug before carrying out any maintenance works.

Electrical security

The present Elmasonic S unit is maintenance-free.
Check the housing and the mains cable for damage regularly in order to prevent electrical accidents.

Care of transducer tank

In order to prolong the service life of the transducer tank, remove the cleaning residues regularly, in particular metal particles and rust film particles.

Lime deposits on the stainless-steel tank e.g. can be cleaned gently with elma clean 40 or elma clean 115C (operate the unit with concentrate + water).

If the unit is used for medical purposes we recommend to disinfect the transducer tank and the tank edge regularly (standard surface disinfectants).

Grid of air fan

Check regularly the grid of the air fan at the bottom of the unit (not existent in all units).

Remove dirt if necessary to allow sufficient ventilation inside the unit.

Care of housing

Residues of cleaning media can be wiped away with a household cleaner or decalcifier depending on the kind of contamination. Do not put the unit under water!

7.2

Service life of the transducer tank



The transducer tank and particularly the ultrasound transmitting surfaces are wear parts. The changes on the surfaces that occur after a certain operating period are visible first as grey areas and later on as material abrasions, the so-called cavitation erosion.

To prolong the service life of your ultrasonic unit even more we recommend to observe the following instructions:

- Regularly remove any cleaning residues, in particular metal particles and rust films.
- Use suitable cleaning chemicals, with particular caution concerning the kind of removed contamination (see instructions *section 6.2*).
- Abrasive particles from removed contaminations (e.g. polishing pastes) must be drained and removed from the cleaning tank as frequently as possible (exchange the cleaning bath).
- Exchange the cleaning medium before it is too heavily contaminated.
- Do not operate the ultrasound unnecessarily; switch off after the cleaning process.

7.3

Repair

**Opening by authorized
specialized personnel
only**

Repair and maintenance works which require the unit to be connected and opened must be carried out by authorized and specialized personnel only.



Separate the unit from the mains before opening up the housing. The manufacturer cannot be held responsible for any damage caused by unauthorized repair works.

In case of damage please contact the manufacturer or your supplier.

7.4 Troubleshooting

Fault / Malfunction	Possible cause	Remedy
housing or mains cable damaged	<ul style="list-style-type: none"> transport damage, caused by third party 	return unit to supplier or manufacturer
no operation; control lamps off	<ul style="list-style-type: none"> mains plug not plugged in dead socket mains cable damaged / interrupted 	<ul style="list-style-type: none"> plug in mains plug check socket / fuse return unit to manufacturer/supplier return unit to manufacturer/supplier
no ultrasound control lamp US off, heating OK	<ul style="list-style-type: none"> timer not activated faulty timer 	<ul style="list-style-type: none"> switch timer "on" return unit to manufacturer/supplier
no ultrasound control lamp US on, heating OK	<ul style="list-style-type: none"> faulty electronics 	<ul style="list-style-type: none"> return unit to manufacturer/supplier
cleaning result not satisfactory	<ul style="list-style-type: none"> no cleaning medium /or unsuitable cleaning medium has been used cleaning cycle too short 	<ul style="list-style-type: none"> use suitable cleaning medium repeat cleaning cycle
unit does not heat up; heating control lamp off; US can be activated	<ul style="list-style-type: none"> faulty heating switch faulty control thermostate (no clicking sound when switched) 	<ul style="list-style-type: none"> return unit to manufacturer/supplier dto.
heating period too long	<ul style="list-style-type: none"> heating energy escapes no revolution of cleaning liquid 	<ul style="list-style-type: none"> use cover (optional accessory) e.g. switch on US (see section 5.2)
unit makes boiling sounds during heating-up period	<ul style="list-style-type: none"> no revolution of cleaning liquid 	<ul style="list-style-type: none"> e.g. switch on US (see section 5.2)
set temperature is exceeded	<ul style="list-style-type: none"> temperature sensor does not measure the average temperature (no revolution) set temperature too low ultrasonic energy heats up the liquid (physical process) 	<ul style="list-style-type: none"> stir liquid by US or by hand do not switch on heating for low set temperatures switch on US for short periods only

8

Putting out of action and waste disposal



The unit can be taken to metal and electronics recycling stations or returned to the manufacturer.

9

Supplier contact address

TECHSPAN GROUP

Australia:

Phone 1-800 148 791

Fax 1-800 148 799

info@elma-ultrasonic.com.au

New Zealand:

Phone (09) 827 6567

Fax (09) 827 6596

info@elma-ultrasonic.co.nz

www.techspanonline.com

Do you have any queries or suggestions concerning the present unit, its operation or the Operating Instructions?

Please contact us, we will be glad to assist:

Technical Support

Australia: P- 1-800 148 791 F- 1-800 148 799

info@elma-ultrasonic.com.au

New Zealand: P 0800 603 603 F- (09) 827 6596

info@elma-ultrasonic.co.nz